AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A process for producing hexafluoroethane, comprising a step of distilling a crude hexafluoroethane containing chlorine compounds each having two carbon atoms to distill out hexafluoroethane as a top flow from the top of a distillation column and separate a hexafluoroethane mixture containing said chlorine compounds as a bottom flow from the bottom of the distillation column, and a step of contacting said bottom flow with hydrogen fluoride in the gas phase at a temperature of 300 to 500°C in the presence of a fluorination catalyst to fluorinate said chlorine compounds.

2. (original): A process for producing hexafluoroethane, comprising (I) a step of producing a crude hexafluoroethane containing chlorine compounds each having two carbon atoms, (II) a step of distilling said crude hexafluoroethane to distill out hexafluoroethane as a top flow from the top of a distillation column and separate a hexafluoroethane mixture containing said chlorine compounds as a bottom flow from the bottom of the distillation column, and (III) a step of contacting said bottom flow with hydrogen fluoride in the gas phase at a temperature of 300 to 500°C in the presence of a fluorination catalyst to fluorinate said chlorine compounds.

3. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein the chlorine compound having two carbon atoms contained in said crude hexafluoroethane is at least one compound selected from the group consisting of dichlorotetrafluoroethane, chloropentafluoroethane, 1-chloro-2,2,2-trifluoroethane, 1,1-dichloro-2,2,2-trifluoroethane and 1-chloro-1,2,2,2-tetrafluoroethane.

4. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein the top flow contains at least 80 vol% of the hexafluoroethane introduced into the distillation column.

5. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein said fluorination catalyst is a supported or bulk catalyst comprising a trivalent chromium oxide as the main component.

6. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein the molar ratio of the hydrogen fluoride to the hexafluoroethane mixture contained in said bottom flow (hydrogen fluoride/hexafluoroethane mixture) is from 0.05 to 10.

7. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein the concentration of said chlorine compounds contained in said hexafluoroethane mixture is 1 vol% or less.

8. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein said crude hexafluoroethane is a gas obtained by reacting dichlorotetrafluoroethane and/or chloropentafluoroethane with hydrogen fluoride in the gas phase in the presence of a fluorination catalyst.

9. (previously presented): The process for producing hexafluoroethane as claimed in claim 1, wherein said crude hexafluoroethane is a gas obtained by reacting 1,1,1,2-tetrafluoroethane and/or pentafluoroethane, containing the chlorine compounds as impurities, with a fluorine gas.

10. (original): The process for producing hexafluoroethane as claimed in claim 9, wherein the reaction with the fluorine gas is carried out in a gas phase in the presence of a diluent gas.

11. (original): The process for producing hexafluoroethane as claimed in claim 10, wherein the diluent gas is a gas containing at least one of tetrafluoromethane, hexafluoroethane, octafluoropropane and hydrogen fluoride.

12. (previously presented): The process for producing hexafluoroethane as claimed in claim 10, wherein the diluent gas is a gas rich in hydrogen fluoride.

13. (previously presented): The process for producing hexafluoroethane as claimed in claim 9, wherein the reaction with the fluorine gas is carried out at a temperature of 250 to 500°C.

14. (previously presented): The process for producing hexafluoroethane as claimed in claim 9, wherein the concentration of 1,1,1,2-tetrafluoroethane at the inlet of a reactor is 4 mol% or less in the reaction with the fluorine gas.

15. (previously presented): The process for producing hexafluoroethane as claimed in claim 9, wherein the concentration of pentafluoroethane at the inlet of a reactor is 6 mol% or less in the reaction with the fluorine gas.

16. (previously presented): The process for producing hexafluoroethane as claimed in claim 9, wherein the reaction with the fluorine gas is carried out under a pressure of 0 to 3 MPa.

17. (previously presented): The process for producing hexafluoroethane as claimed in claim 2, wherein after removing acidic components from the gas obtained through said step (III), at least a part of said gas is re-circulated to the step (I) and/or the step (II).

18. (canceled).

19. (canceled).

20. (new): The process for producing hexafluoroethane as claimed in claim 1, wherein the hexafluoroethane mixture contains 90 mol% or more of CF_3CF_3.

21. (new): The process for producing hexafluoroethane as claimed in claim 2, wherein the hexafluoroethane mixture contains 90 mol% or more of CF_3CF_3.